

## SECTION 11031 - EDDY-CURRENT DRIVES

### City of San Diego, CWP Guidelines

#### PART 1 - GENERAL

##### 1.1 THE WORK OF THIS SECTION

- A. The WORK of this Section includes providing eddy-current variable speed drive units with controls, couplings, accessories and spare parts.

##### 1.2 RELATED SECTIONS

- A. The WORK of the following Section applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

- 1. Section 11030 Variable Speed Drives, General

##### 1.3 FACTORY TESTING

- A. **Product Testing:** Eddy-current drives shall be tested at the factory for compliance with the indicated requirements. Level points shall be programmed and the eddy-current drive system shall be run with a motor of similar characteristics under simulated conditions.
- B. **Witnesses:** The OWNER and the CONSTRUCTION MANAGER (at the option of either) reserve the right to witness factory tests.
- C. **Test Results:** Results of factory testing shall be submitted to the CONSTRUCTION MANAGER with the OWNER'S MANUAL.

##### 1.4 SERVICES OF MANUFACTURER

- A. **Inspection, Startup, and Field Adjustment:** An authorized service representative of the manufacturer shall visit the site for not less than [ ] days.

#### PART 2 - PRODUCTS

##### 2.1 GENERAL REQUIREMENTS

- A. **Drive Construction:** The variable speed drive shall be an eddy-current coupling type magnetic drive, of air-cooled open type construction. Each magnetic clutch shall consist of a stationary frame, a ring member driven at motor speed, and a variable speed member, bearings, outer bearing bracket and housing, heat exchanger (if recommended by the manufacturer), motor adapter, mounting ring base giving access to the upper coupling, and all other components required to provide a complete, satisfactory operating unit. The magnetic clutch shall be of salient pole design. The pole casting shall be high-permeability steel. The magnetic coil shall be wired with NEMA Class F insulation formed and molded into a homogeneous entity in a high-grade epoxy resin.

- B. **Sizing Criteria:** The drives shall be sized to be non-overloading and to have a slip of no more than 3 percent, when running at maximum output speed, and when transmitting the nameplate rating of the driving motor. The stepless speed range shall be continuous from maximum through 40 percent of maximum output speed.
- C. **Efficiency:** The minimum overall efficiency, including losses such as motor efficiency, variable speed drive slip, windage, and excitation, of motor/variable speed drive combinations, when the drive is transmitting motor nameplate full load rating at maximum output speed, shall be not less than 90 percent.
- D. **Bearings:** Bearings shall be of the antifriction type, sized to support the equipment or pump hydraulic thrust recommended by the equipment manufacturer. Bearings shall be grease- or oil-lubricated with readily accessible inlet and outlet grease fittings for grease-lubricated equipment to allow for "in service" regreasing. Inner bearing protection shall consist of an internal shaft flinger or inner bearing cap. Bearings may be water-cooled if recommended by the manufacturer. Bearing temperature sensors shall be provided.
- E. **Overtemperature Protection:** Each magnetic clutch shall be fitted with a thermostatic element designed for overtemperature protection.
- F. **Speed Control:** Speed control equipment shall be housed in a free-standing, front-accessible enclosure constructed to match finish, height, material, and general construction of the adjacent motor control centers. Each control unit shall be housed in a separate compartment, properly ventilated, and provided with sufficient dust filters to keep internal components clean and functional.
- G. **Cooling Systems:** The cooling system shall be recommended by the manufacturer and designed to maintain internal operating temperatures within temperature limitation of all internal components and designed to prevent recirculation of exhaust air.
- H. **Controls and Indicators:** Each controller shall be equipped with the following door-mounted controls and indicators:
  - 1. Local speed indicator.
  - 2. Manual-off-automatic speed control mode selector.
  - 3. Local manual speed adjusting potentiometer.
  - 4. Local on-off switch.
  - 5. High temperature lamp and reset button.
  - 6. Control circuit breaker.
  - 7. Alarm horn and silence pushbutton.
- I. **Additional Circuitry:** Controller internal provisions shall include minimum and maximum speed setting potentiometers and segregated terminal blocks as follows:
  - 1. Motor starter interconnections.
  - 2. Clutch over-temperature device.
  - 3. High temperature lockout.
  - 4. Surge protection from input ac line transient.

## 2.2 NAMEPLATES, TOOLS AND SPARE PARTS

- A. **Nameplates:** Nameplates of stainless steel shall be engraved or stamped and fastened to the equipment in accessible locations. Nameplates shall contain the manufacturer's name, model, serial number, size, characteristics, and appropriate data describing the equipment performance ratings.
- B. **Tools:** The WORK includes special tools necessary for maintenance and repair; tools shall be stored in tool boxes, and identified with the equipment number by means of stainless steel or solid plastic name tags attached to the box.
- C. **Spare Parts:** The WORK includes the following spare parts stored in tool boxes, and identified with the equipment number by means of stainless steel or solid plastic name tags attached to the box:
  - 1. One set of 3 spare fuses of each size.
  - 2. Two spare lamp lenses of each color.
  - 3. Two dozen pilot lamps.
  - 4. One of each type of electronic circuit board used.

## 2.3 MANUFACTURERS

- A. Eddy-current drives shall be manufactured by one of the following (or equal):
  - 1. U.S. Electrical Motors, Inc.
  - 2. Eaton Corporation

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Conduit stub-ups for interconnected cables and remote cables shall be located and terminated in accordance with the drive manufacturer's recommendations.
- B. The Manufacturer shall review the operating environment that the eddy-current drive will be subjected to, and advise the CONSTRUCTION MANAGER prior to bidding of any potential problems, which could prevent the drive from functioning as intended, and shall make recommendations for correcting or preventing potential problems.

\*\* END OF SECTION \*\*